

Remarks

The Restriction Requirement

The Office requires restriction to one of two inventions under 35 U.S.C. 121. Invention I is embodied in Claims 1-11 and 32. Invention II is embodied in Claim 17. Applicant confirms the 6 January 2004 provisional election to prosecute Claims 1-11 and 32 that represent Invention I.

The Rejection Over Nagata et al.

The Office rejects Claims 1-11 and 32 under 35 U.S.C. 102(b) as being anticipated by Nagata et al. (USP 5,567,744). The Office suggests that Nagata et al. teach a polymer blend composition and a method of making that composition comprising mixing a high water-absorbent resin (super absorbent polymer) and a thermoplastic resin. The Office concludes that the blend composition is the same as that claimed by Applicant and builds upon that conclusion to suggest that the Nagata et al. composition would inherently be extrudable.

Applicant respectfully traverses the rejection of Claims 1-11 and 32. Applicant also asks the Office to withdraw the rejection over Nagata et al. as the reference does not support an anticipation rejection or establish prima facie obviousness.

Nagata et al. do not, contrary to the Office's assertion, prepare a blend. Merriam Webster's Collegiate Dictionary, Tenth Edition (1997) defines the noun form of "blend" as "1: something produced by blending: as a: a product prepared by blending". The verb form of "blend" is "1: mix: esp: to combine or associate so that the separate constituents or line of demarcation cannot be distinguished 2: to prepare by thoroughly intermingling different varieties or grades". Rather, Nagata et al. clearly teach a skilled artisan to prepare a composite. Disregarding for the moment the difference in sizes between sugar crystals and a donut hole, the Nagata et al. composite resembles a granulated sugar-coated donut hole. In other words, the sugar crystals either fuse to or are bonded to outer surface of the donut hole. At column 1, lines 8-10, Nagata et al. teaches fusing or fixing a polymer, typically a granular or fibrous product (column 3, lines 1-2), to the surface of high water-absorbent resins, usually in the form of powders (column 1, lines 27-28).

The claimed invention is a polymer blend, rather than a physical admixture of powders. Applicant respectfully directs the Office to the Application at page 7, lines 21-29 where Applicant defines the term "extrudable thermoplastic superabsorbent polymer blend composition". The Office will note, for example, that the blend composition is melt processable, and suitable to be commuted to re-extrudable pellets that have measurable melt

properties including melt flow rate, melt draw rate and melt strength (also known as “melt tension”).

As amended herein, Claim 1 relates to a melt-mixed extrudable polymer blend composition. Nagata et al. lacks any teaching or suggestion that its resin composition which is produced by fusing or fixing a thermoplastic resin onto a surface of a high water absorbent resin either might or should be converted to a melt-mixed composition. In fact, column 1, lines 61-67, of Nagata et al. states that the invention is complete when the thermoplastic resin is directly or adhesively fused or fixed onto the surface of the high water-absorbent resin. This structure solves the problem Nagata et al. notes at column 1, lines 27-28 with respect to lack of adhesion of the high water-absorbent resin particles.

Nothing in Nagata et al. suggests dispersing a high water-absorbent resin particle in a thermoplastic resin matrix or developing a two-phase melt mixed blend or a co-continuous melt mixed blend. By way of contrast, components of the claimed polymer blend may, according to page 8, lines 7-10, be present as co-continuous phases or separate phases. Either phase arrangement is acceptable as long as it does not “have a significant deleterious effect on the melt processability or performance of the blend composition”. The physical admixture or coated powder arrangement of Nagata et al. clearly cannot qualify as a co-continuous phase arrangement, at least in the context of a melt-mixed extrudable blend composition.

Nagata et al. says nothing about an interaction or reaction between a thermoplastic resin and a high water-absorbent resin. Nagata et al. also gives a skilled artisan no guidance as to the possibility for, or desirability of, an ionic or covalent interaction between a thermoplastic resin and a high water-absorbent resin. While it may be unclear whether such an interaction takes place when thermoplastic resin powder is heated enough to soften its surface and render it tacky enough to stick or adhere to the high water-absorbent resin particles, Applicant respectfully submits that such an interaction is highly unlikely when an adhesive binder is used to fix the thermoplastic resin particles to the surface of high water-absorbent resin particles. The melt mixed nature of the claimed composition promotes such an interaction.

The problem that Nagata et al. seeks to solve does not raise the need to explore melt flow properties. As shown in production Examples 1-8, Nagata et al. simply wants to adhere the composite resin composition to a paper sheet. Applicant does not simply want to stick high water-absorbent resin particles to a sheet. Applicant wants and claims an extrudable blend with defined melt flow properties.

The claim amendments discussed above do not add any new fees. If Applicant is in error, Applicant authorizes the Office to assess the appropriate fee to Deposit Account Number 04-1512. If the Office assesses such a charge, Applicant asks the Office to advise the undersigned as to the amount of, and basis for, such charge.

As a point of information only, and not as a supplemental Information Disclosure Statement, Applicant notes that US Patent 6,534,572, a patent related to US Patent 6,458,877 which was disclosed in a supplemental Information Disclosure Statement mailed 26 January 2004, issued 18 March 2003. The '877 patent is a continuation of the '572 patent even though it issued over five months earlier than the '572 patent.

Applicant respectfully requests withdrawal of all rejections and allowance of Claims 1-11, 32 and new Claim 33 at an early date.

Respectfully submitted,

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WHAT IS CLAIMED IS:

1. (amended herein) An extrudable melt-mixed thermoplastic superabsorbent polymer blend composition comprising
 - (a) one or more superabsorbent polymer and
 - (b) one or more thermoplastic resin comprising a functional group which interacts ionically or covalently with (a).
2. (original) The extrudable thermoplastic superabsorbent polymer blend composition of Claim 1 having a melt draw down rate between about 5 and about 100 feet per minute and a melt tension between about 0.1 and about 10 under temperature and applied load conditions that give a melt flow rate of between about 0.1 and about 300 g/10 min.
3. (original) The extrudable thermoplastic superabsorbent polymer blend composition of Claim 1 wherein the superabsorbent polymer is prepared from water-soluble α,β -ethylenically unsaturated monomers.
4. (original) The extrudable thermoplastic superabsorbent polymer of Claim 3 wherein the α,β -ethylenically unsaturated monomers is a monocarboxylic acid, a vinyl polycarboxylic acid, an acrylamide or mixtures thereof.
5. (original) The extrudable thermoplastic superabsorbent polymer blend composition of Claim 1 wherein the superabsorbent polymer is a cellulosic-graft copolymer, a starch-graft copolymer, a starch-g-poly(acrylic acid), a polyacrylamide; a polyvinyl alcohol, a poly(acrylic acid), a copolymer of sulfonic acid group containing monomer, or mixtures thereof.
6. (original) The superabsorbent polymer of Claim 5 is crosslinked, partially neutralized, surface treated or combinations thereof.
7. (original) The extrudable thermoplastic superabsorbent polymer blend composition of Claim 1 wherein the thermoplastic resin is a polyacrylic acid, ethylene and acrylic acid copolymer, ethylene, t-butylacrylate and acrylic acid terpolymer, ethylene and methacrylic acid copolymer, ionomers of ethylene and methacrylic acid copolymers, ethylene, vinyl acetate and carbon monoxide terpolymer, ethylene and carbon monoxide copolymer, ethylene, acrylic acid and carbon monoxide terpolymers, ethylene, n-butylacrylate and carbon monoxide terpolymer or blends thereof.

8. (original) The extrudable thermoplastic superabsorbent polymer blend composition of Claim 1 further comprising a surfactant.

9. (original) The extrudable thermoplastic superabsorbent polymer blend composition of Claims 1, 3 or 8 further comprising a polyethylene, a copolymer of polyethylene, a polypropylene, a copolymer of polypropylene or polystyrene.

10. (original) A method for preparing an extrudable thermoplastic superabsorbent polymer blend composition comprising the step of combining:

- (a) one or more superabsorbent polymer and
- (b) one or more thermoplastic resin comprising a functional group which interacts ionically or covalently with (a).

11. (original) The method of Claim 10 further comprising the step of combining (c) a surfactant.

12. (withdrawn) A method for producing an extruded or molded article of an extrudable thermoplastic superabsorbent polymer blend composition comprising the steps of:

- 1) preparing an extrudable thermoplastic superabsorbent polymer composition comprising
 - (c) one or more superabsorbent polymer and
 - (b) one or more thermoplastic resin comprising a functional group which interacts ionically or covalently with (a) and
- 2) extruding or molding said thermoplastic superabsorbent polymer composition into an extruded or molded article.

13. (withdrawn) The method of Claim 12 wherein the superabsorbent polymer composition further comprising (c) a surfactant.

14. (withdrawn) The method of Claims 12 or 13 wherein the extruded article is a monolayer film, a multilayer film, a nonwoven web, a sheet, a foam, a profile, a multilayer laminate, a fiber, a tube, a rod or a pipe.

15. (withdrawn) The method of Claims 12 or 13 wherein the extruded article is a monofilament fiber, a bicomponent monofilament fiber, a spun bond nonwoven web, a melt blown nonwoven web, or a composite comprising combinations thereof.

16. (withdrawn) The method of Claims 12 or 13 wherein the extruded article is a nonwoven web comprising a spun bond nonwoven web comprising one or more bicomponent fiber, a melt blown nonwoven web comprising one or more

bicomponent fiber; or a composite structure comprising at least one layer of one or more spun bond nonwoven web and at least one layer of one or more melt blown nonwoven web wherein one or more layers of the composite comprise bicomponent fibers.

17. (withdrawn) The composition of Claims 1 or 8 in the form of an extruded or molded article.

18. (withdrawn) The extruded or molded article of Claim 17 is a monolayer film, a multilayer film, a nonwoven web, a sheet, a foam, a profile, a multilayer laminate, a fiber, a tube, a rod or a pipe.

19. (withdrawn) The extruded or molded article of Claim 17 is a monofilament fiber, a bicomponent monofilament fiber, a spun bond nonwoven web, melt blown nonwoven web, or a composite comprising combinations thereof.

20. (withdrawn) The extruded or molded article of Claim 17 is a nonwoven web comprising a spun bond nonwoven web comprising one or more bicomponent fiber, a melt blown nonwoven web comprising one or more bicomponent fiber, or a composite structure comprising at least one layer of one or more spun bond nonwoven web and at least one layer of one or more melt blown nonwoven web wherein one or more layers of the composite comprise bicomponent fibers.

21. (withdrawn) The monolayer film or multilayer film of Claim 18 laminated to a metal.

22. (withdrawn) A power cable comprising the metal laminate of Claim 21.

23. (withdrawn) A communications cable comprising the metal laminate of Claim 21.

24. (withdrawn) A power cable comprising the monolayer film or multilayer film of Claim 18.

25. (withdrawn) A communications cable comprising the monolayer film or multilayer film of Claim 18.

26. (withdrawn) A disposable absorbent device comprising an extruded or molded article of Claim 18.

27. (withdrawn) The disposable absorbent device of Claim 26 is a diaper, a sanitary napkin, a tampon, an incontinence product, a hospital gown or a bed pad.

28. (withdrawn) A disposable absorbent device comprising an extruded or molded article of Claim 19.

29. (withdrawn) The disposable absorbent device of Claim 28 is a diaper, a sanitary napkin, a tampon, an incontinence product, a hospital gown or a bed pad.

30. (withdrawn) A disposable absorbent device comprising an extruded or molded article of Claim 20.

31. (withdrawn) The disposable absorbent device of Claim 30 is a diaper, a sanitary napkin, a tampon, an incontinence product, a hospital gown or a bed pad.

32. (previously added) An extrudable thermoplastic superabsorbent polymer blend composition comprising

(a) one or more superabsorbent polymer and
(b) one or more thermoplastic resin comprising a functional group which interacts ionically or covalently with (a), the thermoplastic resin being a polyacrylic acid, ethylene and acrylic acid copolymer, ethylene, t-butylacrylate and acrylic acid terpolymer, ethylene and methacrylic acid copolymer, ethylene, vinyl acetate and carbon monoxide terpolymer, ethylene and carbon monoxide copolymer, ethylene, n-butylacrylate and carbon monoxide terpolymer or a blend thereof), the composition having a melt draw down rate between about 5 and about 100 feet per minute and a melt tension between about 0.1 and about 10 under temperature and applied load conditions that give a melt flow rate of between about 0.1 and about 300 g/10 min.

33. (New) The extrudable blend of Claim 1, wherein the thermoplastic resin is present in an amount of greater than about 50 parts by weight but less than or equal to 99 parts by weight based on weight of the blend.